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HOW I DO IT

Safe Placement of Large Cryoprobes During Cryosurgery of Deep Liver Metastases

MICHEL L. RIVOIRE, MD, PhD, PIERRE KAEMMERLEN, MD, AND GUILLERMO MOLINA, MD
From the Department of Surgery, Alexis Carrel University, Léon Bérard Cancer Center, Lyon, France

Cryosurgery of liver metastases can be a curative treatment in patients unable to undergo hepatic reason [1, 2]. Hemorrhage is the major cause of mortality or the main indication for re-operation, specially when treating large, deep, central metastases [3, 4]. We describe here a simple, reliable technique for ultrasound-guided intrahepatic placement of a large cryoprobe.

After full liver mobilization, unresectable deep metastases are mapped out by intraoperative ultrasound. An echogenic 16-gauge needle is inserted through the metastasis under ultrasound guidance. Its mandrel is removed, a guidewire is inserted, and the needle is withdrawn. Dilatation from 8-F to 30-F is performed using a telescopic set of nine metal dilators specially designed for nephrostomy (Olympus®, Hamburg, Germany) (Fig. 1). The first 8-F dilator is inserted over the guidewire through both the normal liver and the tumor. Larger dilators are then gradually inserted to enlarge the channel to 30-F. A 32-F Teflon sheath is inserted over the last dilator (Fig. 2). The dilators and the guidewire are removed, a 1-cm cryoprobe (Erbe®, Tubingen, Germany) is inserted into the sheath, and the sheath is withdrawn to allow contact between the cryoprobe tip and the metastasis. Liquid nitrogen is poured through the probe, and iceball development is monitored by ultrasound. After the metastasis and a margin of normal liver are completely frozen, they

Fig. 2. Dilatation to 30-F is complete. All of the dilators have been positioned over the first 8-F dilator (**a**). A 32-F Teflon sheath (**b**) is slipped into the proper position over the last, 30-F dilator (**c**).

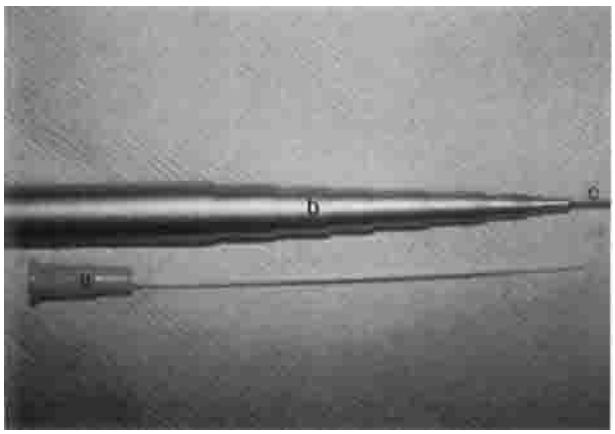

Fig. 1. Extremity of the telescopic dilator and 16-gauge needle (**a**). The nine pieces of metal (**b**) are gradually inserted over the guidewire (**c**) to achieve a 30-F tract through the liver and the metastasis.

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Address reprint requests to Michel L. Rivoire, MD, Department of Surgery, Léon Bérard Cancer Center, 28, Rue Laënnec, 69373 Lyon Cedex 08, France.

are allowed to thaw spontaneously, the cryoprobe being removed 30–45 s after the beginning of the thawing period. The remaining tract is packed with hemostatic material, and the superficial hole is sutured.

We have used this dilatation technique to freeze 15 deep liver metastases in eight patients. Their mean diameter was 4.6 cm. The mean freezing time was 21 min. There was no intraoperative hemorrhage, and no postoperative morbidity or mortality occurred.

The potential role of cryosurgery is to expand the number of patients whose hepatic metastases are amenable to surgery. Its success depends on careful patient selection and complete cryosurgical treatment to ensure adequate tumor destruction. The dilatation technique described here allows safe, precise placement of a large cryoprobe in the center of a deep metastasis.

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REFERENCES

1. Ravikumar TS, Kane R, Cady B, et al.: Hepatic cryosurgery with intraoperative ultrasound monitoring for metastatic colon carcinoma. Arch Surg 122:403–409, 1987.
2. Onik G, Rubinsky B, Zemel R, et al.: Ultrasound-guided hepatic cryosurgery in the treatment of metastatic colon carcinoma. Cancer 67:901–907, 1991.
3. Weaver LM, Atkinson D, Zemel R: Hepatic cryosurgery in treating colorectal metastases. Cancer 76:210–213, 1995.
4. Ross WB, Morris DL: Hepatic cryosurgery [letter]. J R Surg Edinb 38:266, 1993.